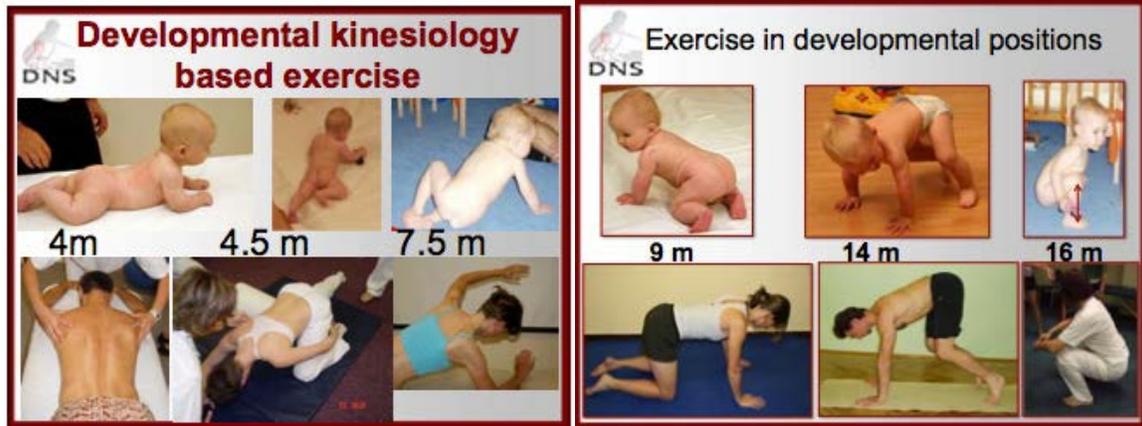


4.5 months is a key stage in that all sagittal plane movements are achievable while maintaining a stable neutral spine and we begin to see a contralateral pattern emerge. This is the first time the child may reach across midline with one extremity while using the other for support. By studying thousands of babies, it is determined that these actions begin as reflexive patterns that occur in the same way and at the same stage of development. The healthy baby does not get taught how to roll over and begin crawling, but rather reflexively develops this pattern. An unhealthy, or poorly developed baby (Example: CP, hypotonia, etc.) will not develop in the same way and will not have proper reflex control of these movements at the correct time as a child. This is very important when we evaluate an adult patient, as an adult should have optimum control of all these locomotor patterns.

When an adult patient experienced improper development – anything from learning to crawl on a very slippery floor to being in a leg brace as a child – we will see a deviation in their control of locomotion and joint stabilization. This adult patient must be taken back to these positions of development and treated in there to establish proper control.



When an injury occurs in an adult patient or athlete, they often revert to pattern of locomotion and stability that is similar to a younger infant (before proper control was reflexively established). This is where we may see a patient with shoulder impingement hold their arm in internal rotation and flexion – similar to an 8 week old child who has not yet begun to externally rotate and extend the arm for support while turning. This adult patient, must also be treated in a developmental position to help re-teach the proper control of this joint.



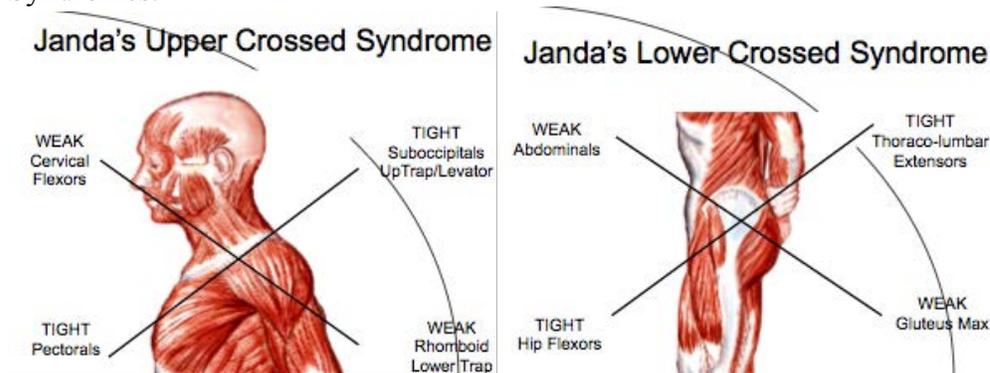
Through careful evaluation we can determine the oldest stage of developmental stability/locomotion that this adult patient can achieve and proceed to a treatment strategy at that stage to effectively rehabilitate the patient. This is where many rehabilitation protocols can create a scenario for future injury – they often jump to a very advanced stage that the athlete cannot yet control. This is building a lot of performance on an immature foundation and is a recipe for injury and weakness. We must establish a proper base of developmental strategies and then build the performance on to this base.

Muscle Imbalances and Sensorimotor Treatment According to Prof. Janda



Prof. Janda's vital body of work focused on muscle imbalances, movement impairments, and musculoskeletal pain. Prof. Janda approached the musculoskeletal system and CNS as one single unit. The CNS serves as an organizer and programmer and coordinator of movement while the muscular system acts as a sensor and effector of movement. In this way the athlete is evaluated for adaptations due to abnormal CNS function, reflex activity of muscles, repetitive

function/fatigue, UE and LE dominance, and pain. A lesion often resides in altered movement and inappropriate load of structures –rather in the structure itself. An area of pain may in fact be an area of acute decomposition, but is not typically the cause of the pain. In other words the source of pain is not typically the cause of pain. Janda defined predictable patterns of weakness and tightness throughout the body. These are areas where the agonist muscle is reciprocally inhibited by an overactive tight antagonist muscle of the same joint. These are pictured below as Upper and Lower Crossed Syndromes.



By applying Janda's principles, we now approach each joint with an evaluation of all the muscles and muscle chains that apply force onto that joint. A weak rhomboid is rarely treated apart from the tight pectoralis musculature that is inhibiting the rhomboid. Conversely we will often strengthen the deep neck flexors to reflexively release the tight symptomatic suboccipitals.

Manual Therapy According to Prof. Karel Lewit



Prof. Lewit was a major advocate and developer of joint and muscle manipulation in modern medicine. Still practicing medicine today at age 97, Prof. Lewit wrote a book on manual medicine for his doctorate thesis, which was published in 10 languages beginning in 1967. This book, strengthened by over 200 journal publications has helped to establish manual therapy and manipulative practices in modern medicine. Prof. Lewit has taught his diagnostic and treatment

approaches for the locomotor system in over a dozen countries and continues to develop his approach today. These manual techniques respect the principles of developmental kinesiology and joint centration, while being quite diverse and encompassing. When applying these manipulative techniques we are assuring that the joint position is not compromised and that the forces are well balanced to restore full motion and positioning of the joint. These techniques are woven through most of the more advanced applications of DNS.



Reflex Locomotion According To Prof. Vojta



Prof. Vojta studied babies with cerebral palsy extensively in the 50's and 60's. In comparison to a healthy baby, these children were not developing in the predictable way according to their age. He noticed that these babies were unable to support themselves on the same zones as healthy babies and had difficulty meeting the major milestones of sagittal stability, turning, crawling, etc. In his studies, he began to hold these babies into the positions of support corresponding to the stage of development they should have been in. In holding these babies with certain joints in a support position/function, it was observed that there was some reflexive activation of the musculature surrounding the joint. The babies held supine began to breath into their abdomen and raise their legs. The babies supported prone began to contract their scapular muscles synergistically with the pectoralis musculature to upright themselves. Partial

patterns of the reflexive locomotion he noted in healthy babies were now being elicited in developmentally delayed babies.

Healthy Baby



Reflex Stimulation/holding



Typically as a baby ages through these initial years of development the reflexive aspects of locomotion begin to disappear as they are replaced with higher CNS function. We can, however, still stimulate this reflexive locomotion in an adult patient through stimulation of the support zones while positioned into developmental postures. When applied to an adult patient the response is not as aggressive as when applied to a baby, but the results are still profound. This reflex locomotion is used in athletes as a nervous system tonic – to prepare the body for advanced positioning and performance. We also use reflex locomotion to subconsciously activate a proper pattern of stability in an athlete who has lost fine motor control of a joint through either injury or fatigue.



Once this pattern of locomotion and stabilization is initiated with reflex locomotion, the athlete is immediately moved into a rehabilitation exercise that will strengthen the movement on a cortical level. In this way, the athlete gains control of the movement and can build performance on to the stable patterns.



DNS - A Comprehensive Approach



Prof. Kolar has taken the individual therapies and approaches of his mentors and woven them together in a very complete and exciting manner. The exercises and advanced positions he developed out of the study of DK have been used to treat and train world-class athletes such as Jarmir Jagr and Jan Železný. The same approach is being used today in various MLB, NHL, NBA, MLS, and NFL clubs by a handful of trainers and physicians.

The scope of DNS is quite broad with courses focused on sport, orthopedics, GIGU and GERD, right down to women's health. This is possible due to the global reactions elicited in DNS treatment, where a single therapeutic measure will affect several body systems and dysfunctions. DNS moves away from isolated treatment of joints, muscles, and nerves while encompassing those treatments into a global approach. DNS looks an injury or performance deficit as window into a chain or system of dysfunction that can be quickly mended.

“Function is as real as structure, physiology is as real as anatomy. However, unlike anatomical, functional norms are still not clearly defined”

-Prof. Karel Lewit

Please accept this paper as an invitation to the first U.S. Dynamic Neuromuscular Stabilization (DNS) research symposium in Northbrook (Chicago), IL. October 23, 2013. The symposium will feature 12 research presentations on various aspects of DNS and its clinical application and will be capped with a 3-hour presentation by renowned physician and DNS developer prof. Pavel Kolar. In his presentation he will discuss advanced topics of rehabilitation, demonstrate new DNS techniques, and perform grand-rounds with several live-patient demonstrations. For more information, please visit rehabps.com, gripapproach.com, http://rehabps.com/REHABILITATION/DNS_Symposium.html, and register for the course at rehabfai.com

CEU and CME credits will be available through RIC for MD, DO, PT, ATC, and DC attendees.

Benjamin Fergus
GRIPApproach.com

Alena Kobesova MD, PhD
Rehabps.com

**Quotes and images used with permission from Prague School of Rehabilitation.